1.0 Introduction

The City of Carlsbad has conducted Dry Weather Analytical Monitoring for several years. The Dry Weather Monitoring Program outlined below is the result of years of experience conducting this program. The program has been modified to meet or exceed the requirements of the Permit while taking into account what has been learned about the system.

Overall, the objective of this program is to detect and eliminate illicit connections and illegal discharges (IC/IDs) in order to minimize the negative impacts on receiving water bodies. Illicit connections and illegal discharges have the potential to transport large amounts of various pollutants to MS4s through storm water runoff and non-storm water discharges. The Permit requires that all Copermittees establish an Illicit Discharge Detection and Elimination Component to actively seek and eliminate contaminated discharges to the MS4.

In order to determine specifically what types of discharges are prohibited, the City has established discharge prohibitions, non-storm water discharge exemptions (allowable discharges), and a process for evaluating non-storm water discharge exemptions. IC/IDs can be defined as the following:

An ***illicit connection*** as defined in Order R9-2007-0001 is any connection to the MS4 that conveys an illicit discharge.

An ***illegal discharge*** is the act of disposing of any pollutant to the MS4 that is prohibited by the City of Carlsbad. Illegal discharges may consist of wash water, sediment, spilled chemicals, sewage infiltration, and other pollutants entering the MS4 either intentionally or unintentionally, and all contribute to the degradation of local water quality.

A critical method of IC/ID detection is dry weather analytical and field screening monitoring. The Permit requires each Copermittee to complete the following tasks in developing a Dry Weather Analytical and Field Screening Monitoring Program:

- Select dry weather field screening and analytical monitoring stations
- Complete an MS4 map
- Develop dry weather field screening and analytical procedures
- Conduct dry weather field screening and analytical monitoring.

The City will use dry weather field and analytical monitoring information to characterize dry weather discharges in the MS4 and identify conveyances that are discharging elevated levels of pollutants. Follow-up studies and source investigations will be conducted as required, to detect and eliminate the sources of these pollutants.
There are three components to the dry weather-monitoring program:

1. Field observations
2. Field screening
3. Laboratory analyses.

Field observations include various site descriptions and a series of qualitative (mainly visual) observations of physical and biological conditions at the site. Field screening includes determinations of several water quality parameters and flow in the field. The laboratory analysis component involves the collection of samples for a more extensive laboratory analysis of pollutants that can cause water quality degradation. The presence of abnormal conditions in any

of the three dry weather-monitoring components is justification for initiating a pollutant source identification investigation.

2.0 Selection of Sampling Locations

The City of Carlsbad has identified 60 primary monitoring stations where data will be collected during the dry weather analytical and field screening-monitoring program. Additionally, 14 alternate stations have been identified that will be monitored if any of the primary stations exhibit no flow. The selected primary and alternate monitoring stations, their locations, land-use and drainage areas are presented in Tables 8-1 and 8-2, respectively at the end of this section. More specific information, including a complete map of the MS4 system, primary and alternate sampling station locations, and drainage basins, is included as Appendix 8-1. Dry weather monitoring stations were selected non-randomly to provide adequate coverage of the MS4 by considering the following criteria:

- Previously detected or suspected pollution problem areas
- Location in drainage area
- Hydrologic conditions, including total drainage area of the site
- Traffic density
- Age of structures and buildings in the area
- History of the area
- Land use
- Accessibility, Safety

Sampling Frequencies

Dry weather field screening and analytical monitoring will be conducted at each primary sampling station at least once during the dry season (May 1 – September 30).

Sampling Conditions

Monitoring will not be conducted within 72 hours after any rain event or if local hydrologic conditions indicate that storm flow is still occurring at a site after a rain event. Grab samples will be collected for field analysis at each station where there is ponded or flowing water. An additional set of grab samples will be collected for laboratory analysis at a minimum of 25% of the sites where ponded or flowing water is observed.

Sampling Procedures

Field screening and analytical sampling will be conducted according to the procedures outlined in the Dry Weather Monitoring Sampling Manual (Appendix F). Field personnel will have a copy of these procedures during all storm water field operations. Additional field reference materials will be available at all times including MS4 maps, contact numbers, and field equipment operating manuals and procedures.

Field Screening and Laboratory Analytical Monitoring

All field screening and laboratory analytical monitoring results will be recorded on a Dry Weather Storm Drain Monitoring Data and Observation Sheet (Form 8-1) and follow the procedures given below:

2.1 Field Screening

Field screening will consist of a series of qualitative field observations, flow measurement, and field analyses of selected water quality parameters. Information relating to weather conditions, the amount of time since last rainfall or storm discharge, and the type of storm water conveyance

will also be recorded. Specific observations and results of the field water quality analyses will be recorded on the field data sheet. The data sheet will also serve as a record of the field visit and will be completed for every site visit regardless of whether samples are collected. Laboratory analytical monitoring results will be recorded on the data sheet at a later date, which will be submitted to the RWQCB as part of the dry weather monitoring report for the City of Carlsbad.

a. Qualitative Observations

Qualitative field observations will be made during each site visit whether or not ponded or flowing water is observed. These observations are intended to provide a general assessment of the site and include parameters like odor, water clarity, the presence of floatables, visible deposits, stains, and biological status. Evidence of present or past illicit connections and illegal discharges to the MS4 may be ascertained by careful field observations. Each field screening location will be photographed to provide additional information and documentation of site conditions.

b. Flow Measurement

Flow measurements will be used to estimate pollutant mass loading, prioritize storm drains for future investigation, and identify significant changes in discharge that may be indicative of an illegal release upstream. Field methods will be employed to estimate discharge rates, as described in Form 8-2.

c. Field water quality analyses

At each site with ponded or flowing water, grab samples will be collected and analyzed in the field for the following constituents:

- Specific conductance (calculate estimated Total Dissolved Solids)
- Turbidity
- pH
- Reactive Phosphorus (Ortho-P)
- Nitrate-N
- Ammonia-N
- Surfactants (MBAS)*
- Temperature

* Due to the importance of surfactants, the City will test this parameter both in field and laboratory analyses.

Analytical Monitoring

At a minimum of 25% of the sites where ponded or flowing water is observed, grab samples will be collected and submitted to a California Department of Health Services certified laboratory for analysis of the following constituents using the standard methods presented in Table 8-3:

- Total Hardness
- Oil and Grease
- Diazinon and Chlorpyrifos
- Cadmium (Dissolved)
- Lead (Dissolved)
- Zinc (Dissolved)

- Copper (Dissolved)
- Enterococcus bacteria
- Total Coliform bacteria
- Fecal Coliform bacteria
- Surfactants (MBAS)

Reporting

Beginning May 1, 2008, the City will begin conducting dry weather analytical and field screening monitoring in accordance with the procedures outlined above. The City will collect data during the period of May 1 – September 30 each year and report the results of the dry weather monitoring annually.

2.2 IC/ID Identification

The City of Carlsbad will utilize the following three mechanisms to identify illicit connections and illegal discharges to municipal MS4s:

- Dry Weather Analytical and Field Screening Monitoring
- Public complaints and referrals
- Inspections of businesses and municipal facilities

Dry Weather Analytical and Field Screening Monitoring

As described above, the City will implement a Dry Weather Analytical and Field Screening Monitoring program to detect IC/IDs in the MS4. Dry weather field screening and analytical monitoring information will be used to characterize dry weather discharges in the MS4 and identify conveyances that are discharging elevated levels of pollutants. Based on results obtained from the program, investigations may be required to identify and eliminate the source of specific pollutants that exceed accepted action level concentrations (Table 8-4).

TABLE 1: PRIMARY DRY WEATHER MONITORING STATIONS

Agua Hedionda Lagoon Watershed			
Site Number	**Location**	**Description**	**Land Use**
AH03	East of railroad track, southwest of Maya Street.	72” RCP	Residential
AH08	Agua Hedionda Lagoon at Encinas Power Plant, east of Encinas Plant Tower	96” RCP	Industrial Commercial
AH 09	Behind 5115 Building Avenida Encinas	Manhole 36”RCP	Commercial
AH10	West of Avenida Encinas, near Manzano/El Arbol intersection, near railroad tracks	2-60” RCP	Commercial
AH11	Main line east of I-5, south of Cannon Road, west of the Car Country Carlsbad Sign	36” RCP	Commercial
AH12	Concrete channel east of I-5, west of the Dixon Ford parking lot off Paseo Del Norte	36”RCP	Commercial
AH13	Concrete channel west of Paseo del Norte, approximately 250 feet north of Pea Soup Anderson’s	2-48” RCP	Commercial

Agua Hedionda Lagoon Watershed			
Site Number	**Location**	**Description**	**Land Use**
AH18	South of the Park Drive and Valencia Avenue Intersection	39” RCP	Residential
AH24	Kelly and Park Drive Intersection	Concrete channel	Residential
AH27	Between Pontiac Avenue and La Portalada Drive, north of Tamarack	Concrete channel	Residential
AH28	50 yards east of the La Portalada Drive and Tamarack Avenue intersection, on the north side of Tamarack Ave.	2-60” RCP	Residential
AH30	East of Sierra Morena Avenue, south of Valewood	60”RCP	Residential
AH31	South of Chestnut, east of Sierra Morena Avenue	48” RCP	Residential
AH32	Intersection of Don Arturo and Don Porifirio Drive (in gated community)	Earthen and Concrete Channel	Residential
AH45	500 feet from the south Van Allen Way cul-de-sac, north east of the pond	84” RCP	Commercial
AH46	Outfall located at the north of the horse stable on Sunny Creek Rd	60”RCP	Industrial/Commercial
AH59	Sedimentation basin, approximately 1200 feet north of El Fuerte Street	48” RCP	Commercial
AH61	Northeast of 2875 Loker Avenue	Manhole, 36” RCP	Industrial
AH63*	Tamarack Ave., Hillside Dr., Park Dr., south of Calavo Ct., in east sidewalk	Manhole	Residential
AH65*	Tamarack Ave., Pontiac Dr., across from Southampton Rd.	Manhole	Residential

Batiquitos Lagoon (San Marcos Creek) Watershed			
Site Number	**Location**	**Description**	**Land Use**
BA02	Down in the sediment basin at the southwest corner of Navigator Cir. and Windrose Cir	36” RCP	Residential
BA03	End of Gabbiano on Batiquitos Lagoon Trail	72” RCP	Residential
BA04	In front of 7017 Nutmeg Avenue	Manhole, 42” RCP	Residential
BA06	Batiquitos Drive, midway between Poinsettia Lane and Daisy Avenue	Manhole, 36” RCP	Residential
BA07	Northeast of the intersection of Buttercup Road and Seascape Drive	Manhole, 54”RCP	Residential
BA13	Debris basin outlet to Batiquitos Lagoon, southwest of El Camino Real and Arenal Intersection	60” RCP	Residential
BA26	Between 2526 and 2532 Unicornio Street	Manhole, 42” RCP	Residential
BA27	100 feet into the canyon near the El Fuerte and Chorlito Intersection	42” CMP	Residential
BA32	In front of 2927 Luciernaga Street	Manhole, 42” RCP	Residential
BA34	South of Vista Mariana, in La Costa Golf Course	48” RCP	Residential
BA36	Southeast corner of La Costa Golf Course behind 7525 Gibraltar Street near Round Tree Apartments	48” RCP	Residential
BA40	30 feet southwest of the Melrose Drive and Rancho Santa Fe Road intersection	72” RCP	Commercial/Residential
BA41	(Northern edge) La Costa Canyon Park, in canyon; across from 3015 Pueblo Street	Manhole, 54” RCP	Residential
BA43	30 yards north of the El Camino Real and Levante Street intersection	60” CMP	Residential
BA47	Rancho Santa Fe Blvd. and Camino Alvaro intersection	Manhole	Residential
BA48	500 feet south of the intersection of Camino De Los Coches and Rancho Sante Fe Road	Outfall, 36” RCP	Residential
BA49	Northwest of Batiquitos Lagoon, east of Carlsbad Blvd	Manhole, 72”-81” RCP	Residential
BA51*	Alga Rd., east of El Camino Real, between 2035 and 2043	3 x 84” RCP	Residential
BA52*	Batiquitos Dr., east of Golden Star Lane, north of street inside detention basin	48” RCP	Residential

Buena Vista Lagoon Watershed			
Site Number	**Location**	**Description**	**Land Use**
BV02	East side of State St., south of the Carlsbad Blvd. and State St. intersection	2-48” RCP	Commercial
BV04A	East of Buena Vista Lagoon Ecological Reserve, on the east bank	Outfall, 27” RCP	Commercial
BV06	50 feet west of the S. Vista Way Bridge on the south side of Buena Vista Creek	Outfall 51” RCP	Commercial
BV09	50 yards north of the El Camino Real and Carlsbad Village Drive intersection on the center divider	Manhole	Commercial/ Residential
BV10	Southwest corner of the Carlsbad Village Drive and El Camino Real intersection	18” CMP	Residential
BV15*	Laguna Dr. and State St. intersection, across from 2531 State St.	Manhole	Commercial Industrial
BV16*	Marron Rd. Monroe St. intersection, across from The Olive Garden Restaurant	Manhole	Residential

ENCINAS CREEK WATERSHED			
Site Number	**Location**	**Description**	**Land Use**
EN02A	West of 6030 Avenida Encinas east of the Rail Road tracks	Earthen Channel	Industrial/ Commercial
EN02A-1	Behind 5600 Avenida Encinas near railroad tracks	Concrete Channel	Industrial/ Commercial
EN02B	Inside Encinas Wastewater Plant	Open Channel	Commercial
EN02C	North bank of Encinas Creek, underneath I-5 overpass. Access through Wastewater Plant	39” RCP	Commercial
EN09	Encinas Creek, south of Palomar Airport Road, on Laurel Tree Road	4-48” CMP	Commercial
EN14	Corner of Palomar Oaks Way and Camino Vida Roble, near 1911 Palomar Oaks Way	Manhole, 42” RCP	Commercial
EN14A	30 yards west of 1911 Palomar Oaks Way, in the canyon	48” RCP	Commercial
EN18	Behind 1979 Palomar Oaks Way	48” RCP	Commercial
EN19	Beside 1949 Palomar Oaks Way	Concrete Channel	Commercial
EN20	Across from 1979 Palomar Oaks Way	48” RCP	Commercial
EN21	Camino Vida Roble, midway between Palomar Airport Road and Owens Avenue	Manhole	Commercial
EN23	Northwest corner of Yarrow Drive and Camino Vida Roble intersection	5’x10’ RCB	Commercial
EN24	Between 2225 and 2265 Camino Vida Roble, in front of the Post Office	24” RCP	Industrial/ Commercial
EN31	10 yards north of 1925 Palomar Oaks Way, in the canyon	24” RCP	Industrial/ Commercial

TABLE 2: ALTERNATE DRY WEATHER MONITORING STATIONS

Site Number	Location	Description	Land Use
AH26	200 feet northeast of the Camino Real and Kelly Drive intersection	4.5 Feet Earthen Channel	Commercial/ Residential
AH28A	50 yards east of the La Portalada Drive and Tamarack Avenue intersection, on the north side of Tamarack Ave.	8'x5' RCB	Residential
AH56	In front of 2251 Faraday Avenue	Manhole	Commercial
AH64*	Kelly Dr. and Hillside Dr., intersection in front of 4870, on the sidewalk	Manhole	Residential School
AH66*	El Camino Real across from Cannon Rd., in Parkway Nursery Road, behind Rancho Carlsbad Community	Open Channel	Residential Open space
AH67*	Rutherford Rd. and Aston Ave. intersection, close to the sidewalk	Manhole	Planned Industrial
BA31	Behind 7490 and 7497 Via de Fortuna, inside gated community	72" RCP	Residential
BA50*	La Costa Ave., between Romeria St. and Cadencia St. in front of 3105	Grated catch basin	Residential
BA 53*	Batiquitos Dr., northeast corner of Batiquitos Dr. and Aviara Dr., intersection, inside detention basin	48" RCP	Residential
BV08	South bank of Buena Vista Creek, ten yards west of El Camino Real	66" RCP	Commercial/ Residential
BV14	10 yards west of the Concord and Vancouver Street intersection, northwest side	Manhole, 36" RCP	Residential
EN13	Behind 5860 Dryden Lane, inside Callaway Test Center	36" RCP	Commercial
EN16	Southeast of the intersection of Palomar Airport Road and Palomar Oaks Way	Open Channel	Commercial
EN32*	Palomar Airport Rd., Paseo Del Norte, Camino Del Parque, Caminito Del Sol, in front of 801-802	Manhole	Residential

TABLE 3 SUMMARY OF LABORATORY SAMPLING AND ANALYSIS METHODS

Physical and Inorganic Non-Metals	**Analytical Method**	**Container**	**Volume (mL)**	**Preservative (Always @ 4° C)**	**Holding Time**
TDS	SM 2540C	P	100		7 d
TSS	SM 2540D	P	100		7 d
Turbidity	SM 2130A	P	100		48 h
Alkalinity or Hardness	SM 2320B	P	100		14 d
pH	EPA 150.1	P	10		Field
Conductivity	SM2510B	P	20		28 d
Temperature		N/A			Field
Phosphorous, total	SM4500PE	P	100	H_2SO_4	28 d
Phosphorous, dissolved / reactive	SM4500PE	P	100	H_2SO_4	48 h
Nitrate	SM 4500 NO3 E	P	100		48 h
Nitrite	SM 4500 NO2 B	P	100		48 h
TKN	EPA 351.1	P	200		28 d
Ammonia	SM4500 NH3 D	P	500	H_2SO_4	28 d
BOD	EPA 405.1	P	1000		48 h
COD	EPA 410.4	P	10	H_2SO_4	28 d
Chlorine, Residual	SM4500 Cl G	N/A			Field
Organics					
*Petroleum Hydrocarbons, total (d + g)	EPA 8015	G + 2V	250 + 40 (2)	HCl	14 d
Oil and Grease	EPA 413.1	G	500	HCl	14 d
Diazinon	EPA 8140	G	1000		7 d
Chlorpyrifos	EPA 8140				
Methylene Blue Substances (MBAS)	SM 5540 C	P	250		48 h
Organochlorine Pesticides and PCBs	EPA 8081, 8082	G	1000		7 d
*Volatile Organic Compounds	EPA 8260	2V	40 (2)	HCl	14 d
Semivolatile Organic Compounds	EPA 8270	G	1000		7 d
Metals / Toxics					
Antimony	EPA 6010	P	500	HNO_3	6 m
Arsenic	EPA 6020	P			
Cadmium	EPA 6010	P			
Chromium	EPA 6010	P			
Copper	EPA 6010	P			
Lead	EPA 6010	P			
Nickel	EPA 6010	P			
Zinc	EPA 6010	P			
Thallium	EPA 7470	P			
Silver	EPA 6020	P			
Mercury	EPA 6010	P			28 d
Cyanide	SM 4500 CN C	P	500	NaOH	14 d
Phenols (from SVOC's)	EPA 8270	G	1000		7 d
Bacteriological (including dilutions)					
Coliform, total	SM 9221	P (sterile)	125	$Na_2S_2O_3$	6 h
Coliform, fecal	SM 9221	P (sterile)			
Coliform, *E Coli*		P (sterile)	125		
Enterococcus	SM 9230	P (sterile)	125		
Streptococcus	SM 9230	P (sterile)			

*ZHS (Zero Head Space Required) V=VOA / G=Amber Glass / P=Plastic

TABLE 4 ACTION LEVELS FOR FIELD SCREENING AND LABORATORY PARAMETERS

Field Screening Analytes	Action Levels[1]	Source/ Notes
pH	<6.5 or >9.0	Basin Plan, w/ allowance for elevated pH due to excessive photosynthesis. Elevated pH is especially problematic in combination with ammonia.
orthophosphate-P (mg/L)	2.0	USEPA Multi-sector General Permit
nitrate-N (mg/L)	10.0	Basin Plan, and drinking water standards
Ammonia-N (mg/L)	1.0	Based on Workgroup experience. May also consider unionized ammonia fraction
Turbidity (NTU)[2]	Best Professional Judgment	WQOs relevant to inland surface waters are not available. Base judgment on channel type and bottom, since last rain, backgroun levels, and most importantly visual observation (e.g. unusual colors and lack of clarity), and unusual odors.
Temperature (^{o}F or C)	Best Professional Judgment	Base judgment on season, air temperature, channel type, shading, etc.
Conductivity (umhos/cm) or TDS (mg/L)	Best Professional Judgment	Values > 5,000 umhos/cm may indicate IC/ID however; EC may be highly elevated in some regions due to high TDS groundwater exfiltration to surface water, mineral dissolution, drought, and seawater intrusion. Normal source ID and discharge elimination works is not effective in these situations. Knowledge of area background conditions is important. Values <750 may indicate excessive potable water discharge or flushing.

Laboratory Analytes	Action Levels	Source/ Notes
MBAS (mg/L)	1.0	Basin Plan, w/ allowance based on Workgroup field experience and possible field reagent interferences
Oil and Grease (mg/L)	15	USEPA Multi-sector General Permit. If a petroleum sheen is observed, the sample should be collected from the water surface. Visual observations may justify immediate investigation.
Diazinon (ug/L)	*0.5*	Response to diazinon and chlorpyrifos levels above 0.5 µg/L should focus on education and outreach to potential dischargers in the target drainage basin. Highly elevated levels should be investigated aggressively as with other potential IC/Ids.
Chlorpyrifos (ug/L)	*0.5*	
Dissolved Cadmium (ug/L)	*California Toxics Rule*	Use California Toxics Rule, 1-hour criteria to determine appropriate action level for individual samples. Table provides benchmarks based on hardness and dissolved metals concentration. For example, at 300 mg/L hardness, the following action levels would apply: Cd – 14 ppb; CU – 38 ppb; Pb – 209 ppb; and Zn – 297 ppb.
Dissolved Copper (ug/L)	*California Toxics Rule*	
Dissolved Lead (ug/L)	*California Toxics Rule*	
Dissolved Zinc (ug/L)	*California Toxicx Rule*	
Total Coliform (MPN/ 100 mls)	*50,000*	Action levels are based on upper 90% confidence level of Copermittees 2002 dry weather analytical monitoring data.
Fecal Coliform (MPN/ 100 mls)	*20,000*	
Enterococcus (MPN/ 100 mls)	*10,000*	

[1]The referenced action levels should not be the sole criteria for initiating a source identification investigation. Dry weather monitoring data should be interpreted using a variety of available information. Factors that should be considered include within-site and between-site sample variability.

[3] The statistical outlier test uses the mean and standard deviation of a dry weather data set to determine whether a sample concentration exceeds a given confidence interval (usually 90 or 95%). Those readings that are above the confidence interval **and** exceed the referenced guidelines are identified as outliers and are appropriate for source identification.

City of Carlsbad
Dry Weather Monitoring Field Datasheet

☐ **Routine Investigation** ☐ **IC/ID Follow-Up For** _____

GENERAL SITE DESCRIPTION (NAD 83 decimal degrees to 5th place)

Site ID			**Latitude**		**Watershed**	**Hydrologic Unit**	
Location			**Longitude**			**Hydrologic Area**	
			TB Page			**Hydrologic Subarea** (Optional)	
Date		**Time**		**Observer**		**Discharge Area** (Optional)	

Land Use (Primary) ☐ Residential ☐ Commercial ☐ Industrial ☐ Agricultural ☐ Parks ☐ Open

Land Use (Secondary) ☐ Residential ☐ Commercial ☐ Industrial ☐ Agricultural ☐ Parks ☐ Open

Conveyance ☐ Manhole ☐ Catch Basin ☐ Outlet ☐ Concrete Channel ☐ Natural Creek ☐ Earthen Channel

ATMOSPHERIC CONDITIONS

Weather ☐ Sunny ☐ Partly Cloudy ☐ Overcast ☐ Fog
Tide ☐ N/A ☐ Low ☐ Incoming ☐ High ☐ Outgoing **Tide Height:**_____ft.
Last Rain ☐ > 72 hours ☐ < 72 hours
Rainfall ☐ None ☐ < 0.1" ☐ > 0.1"

RUNOFF CHARACTERISTICS

Odor	☐ None	☐ Musty	☐ Rotten Eggs	☐ Chemical	☐ Sewage	☐ Other _____
Color	☐ None	☐ Yellow	☐ Brown	☐ White	☐ Gray	☐ Other _____
Clarity	☐ Clear		☐ Slightly Cloudy	☐ Opaque		☐ Other _____
Floatables	☐ None	☐ Trash	☐ Bubbles/Foam	☐ Sheen	☐ Fecal Matter	☐ Other
Deposits	☐ None	☐ Coarse Particulate	☐ Fine Particulates	☐ Coarse & Fine	☐ Stains ☐ Oily Deposit	☐ Other
Vegetation	☐ None	☐ Limited	☐ Normal	☐ Excessive		☐ Other _____
Biology	☐ None	☐ Insects	☐ Algae	☐ Snails/Fish	☐ Mussels/Barnacles	☐ Other _____

Flow Observed ☐Yes ☐ No ☐ Ponded ☐ Tidal

Does the storm drain flow reach the Receiving Water? ☐ Yes ☐ No ☐ N/A

Evidence of Overland Flow? ☐ Yes ☐ No ☐ Irrigation Runoff ☐ Other: _____

Photo Taken ☐ Yes ☐ No **Photo #** _____

Field Screening Samples Collected? ☐ Yes ☐ No

Water Temp (°C)		**NH_3-N** (mg/L)		**NO_3** (mg/L)		**Ortho -PO_4** (mg/L)	
pH (pH units)		**MBAS** (mg/L)		**NO_3-N** (mg/L)		Ortho –PO4-P(mg/L)	
COND (mS/cm)		**TURB** (NTU)		**Other**			

Analytical Lab Samples Collected? ☐ Yes ☐ No

FLOW ESTIMATION WORKSHEETS

Flowing Creek or Box Culvert

Width		in
Depth		in
Velocity		ft/sec
Flow		gpm

Filling a Bottle or Known Volume

Volume		mL
Time to Fill		sec
Flow		gpm

Flowing Pipe

Diameter		ft
Depth		ft
Velocity		ft/sec
Flow		gpm

COMMENTS: _____

San Diego Stormwater Copermittees

Land Use Types for Dry Weather Monitoring

(Adopted by the Dry Weather Monitoring Workgroup, April 20, 2004)

1. **Residential**

   Residential (general)
   Single- and multi-family homes, mobile home parks, etc.

   Rural residential (For the County of San Diego and other appropriate Copermittees)
   Single family homes located in rural areas with lot sizes of approximately 1 to 10 acres. Rural residential estates may have small orchards, fields or small storage buildings associated with the residential dwelling unit, etc.

2. **Commercial**

   Offices, schools, shopping centers, auto dealerships, government/civic centers, cemeteries, churches, libraries, post offices, fire/police stations, military use, jails, prisons, border patrol holding stations, dormitories, hotels, motels, resorts, and casinos, etc.

3. **Agricultural**

   Orchards, vineyards, nurseries, greenhouses, flower fields, dairies, livestock, poultry, equine ranches, row crops and grains, pasture, fallow, etc.

4. **Industrial**

   Shipbuilding, airframe, aircraft manufacturing, industrial parks, manufacturing uses such as lumber, furniture, paper, rubber, stone, clay, and glass; auto repair services/recycling centers; warehousing, wholesale trade; mining, sand and gravel extraction, salt evaporation; junkyard, dumps/landfills; auto wrecking/dismantling and recycling centers, etc.

5. **Parks**

   Recreation areas and centers, neighborhood parks, wildlife and nature preserves, golf courses, accessible sandy areas along the coast or major water bodies allowing swimming and picnicking, etc.

6. **Open**

   Vacant and undeveloped lands, etc.

METHODS OF FLOW MEASUREMENT

Calculating the Area (a) of the Cross Section of a Circular Pipe Flowing Partially Full

D = Depth of water a = area of water in partially filled pipe
d = diameter of the pipe Ta = Tabulated Value Then a = Ta*d2

D/d	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.0000	0.0013	0.0037	0.0069	0.0105	0.0147	0.0192	0.0242	0.0294	0.0350
0.1	0.0409	0.0470	0.0534	0.0600	0.0668	0.0739	0.0817	0.0885	0.0951	0.1039
0.2	0.1118	0.1199	0.1281	0.1365	0.1440	0.1535	0.1623	0.1711	0.1800	0.1890
0.3	0.1982	0.2074	0.2187	0.2280	0.2355	0.2450	0.2540	0.2642	0.2780	0.2836
0.4	0.2934	0.3032	0.3130	0.3220	0.3328	0.3428	0.3527	0.3627	0.3727	0.3827
0.5	0.3980	0.4030	0.4130	0.4230	0.4330	0.4430	0.4520	0.4620	0.4720	0.4820
0.6	0.4920	0.5020	0.5120	0.5210	0.5310	0.5400	0.5500	0.5590	0.5690	0.5780
0.7	0.5870	0.5960	0.6050	0.6140	0.6230	0.6320	0.6400	0.6490	0.6570	0.6660
0.8	0.6740	0.6810	0.6890	0.6970	0.7040	0.7120	0.7190	0.7250	0.7320	0.7360
0.9	0.7450	0.7500	0.7560	0.7610	0.7660	0.7710	0.7750	0.7790	0.7820	0.7840

AREA x VELOCITY

(CREEK/CHANNEL METHOD)

a. Measure the width, depth, and velocity of the water.

b. Convert each value to a common unit (i.e. all measurements converted to cm, ft, or in.).

c. Multiply the width * depth * velocity to determine flow.

d. Multiply the flow by 0.8 for creek measurements –or-- 0.9 for concrete channel measurements to account for channel roughness.

e. The results if measured in

a. Ft = Ft^3/sec
b. cm = cm^3/sec (mL/sec)
c. in = in^3/sec

f. Convert to desired value.

TIME REQUIRED TO FILL A KNOWN VOLUME

(FILL A BOTTLE METHOD)

1. Determine volume/capacity of the sample bottle.
2. Measure time required to fill the bottle.
3. Flow will be determined by initial volume units:
   - mL/s
   - oz/s
4. Convert to desired value.

AREA x VELOCITY

(PARTIALLY FILLED PIPE)

g. All measurement must be converted to a common unit before calculation (ft, in, or cm).

h. Let D = water depth.

i. Let d = *inside* pipe diameter

j. Calculate D/d.

k. Find the tabulated (Ta) value on the partially filled pipe formula chart above using the D/d value. (i.e. if D/d = 0.263 then Ta =.1623).

l. Find the area using the formula $a = Ta*d^2$.

m. Multiply area (a) by the water velocity.

n. Convert to desired value.

SAE / Metric Unit Conversion

0.083 ft	=	1 in	=	2.54 cm
0.1337 ft^3	=	**1 gal**	==	**128 oz3.785 L**
0.0078 gal	=	**1 oz**	=	**.0011 ft^3**
1000 cm^3	=	**1 L**	=	**1000 mL**

Based on dry weather field screening and analytical results, follow-up investigations may be necessary to identify and eliminate pollutant sources. In order to determine whether a source investigation is necessary, the following three methods will be employed: (1) Numeric action levels; (2) Statistical confidence intervals; and (3) Best professional judgment. All three approaches are described in detail below and presented in Table 8-4. Table 8-4 reflects the current action level table that is being developed regionally by the monitoring workgroup. This table will be updated as changes are made at the regional level.

1. Numeric action levels

   Numeric action levels will be used as the primary approach for interpreting pH, orthophosphate, nitrate, ammonia, conductivity or TDS, MBAS, oil and grease, Diazinon, and Chlorpyrifos analytical results (Table 8-4). If these action levels are exceeded, then a source identification investigation will be initiated unless best professional judgment indicates otherwise. Dissolved trace metals (Cd, Cu, Pb, and Zn) are compared to the California Toxics Rule 1-hour criteria in combination with hardness levels.

2. Statistical confidence interval

   Identification of highly elevated concentrations using confidence intervals is the primary approach for interpreting total and fecal coliform bacteria and enterococcus data. Dry weather data from all copermittees is being combined so that confidence intervals and other statistical analyses can be completed in March 2003. The adopted action level table will be used during the 2003 dry weather testing.

3. Best professional judgment (BPJ)

   Best professional judgment will be utilized as the primary approach for interpreting turbidity and water temperature data, and the secondary approach for interpreting the results of all other field and laboratory analyses. BPJ is encouraged by the monitoring workgroup as it allows the use of all monitoring tools (observations, field screening, analytical data, discharge, site characteristics, etc.) to determine if conditions warrant follow-up.

When the results of field screening sampling exceed the action levels or confidence intervals presented in Table 8-4, the City will initially confirm the results by resampling. Field analytical results will be confirmed by resampling within between 4 and 24 hours after the initial sample and source investigation will begin thereafter. When the results of a laboratory analytical sample exceed the action levels or confidence intervals, source investigation will begin as soon as possible and another sample will be collected and analyzed to confirm initial results. If visual and /or analytical evidence of gross contamination is present at a site (e.g., substantial petroleum sheen, extremely high ammonia concentration, evidence of a sewage release) then an immediate source identification investigation will be initiated.

The City of Carlsbad proposes to address 100% of reported illicit discharges and connections for investigation, enforcement, and reporting although a performance goal of 95% is expected to meet Permit requirements. The 95% performance goal allows for accounting of investigations "in-progress" where the source was has not been identified at the end of the reporting year. Open investigations that cannot be resolved after 90 days due to the lack of additional information or repeat of the incident or event will be closed. Staff may use the information, if a repeat incident is found at a later date.

Sources of complaints or referrals of illicit connections or illegal discharges include:

- Observations (during routine and non-routine inspections of commercial/industrial businesses),
- Public Reporting (known or suspected discharges), and
- Detections (Dry Weather Monitoring Program).

The process of investigation will follow the diagram provided at the end of this Section and follows the general approach below. To determine whether a discharge or connection is illicit, the City will attempt to identify the source. Determining the source will follow the process outlined below:

- Search the area for any physical, chemical, or biological signs of the reported or field incident
- Explore the possible scenarios of how the material or disturbance occurred
- Identify potential sources and verify origin
- Examine the drainage system area for other possibilities
- Inquire to available businesses or witnesses what had occurred.
- Document findings and information.

Based on each case of observed, reported, or verified detected illicit discharge location, pollutants, concentrations, and specific impacts, the City of Carlsbad will identify and address the following:

1. Evaluation of Discharge
   - Discharge volume,
   - Frequency and abundance, and
   - Duration of Discharge
   - Determine Corrective Action

2. Responsible City Department or Agency
   - Efficient and comprehensive follow-up
   - Develop and refine routines and strategies

3. Documentation
   - Record applicable and pertinent information

4. Information Storage
   - Viable, long-term information retrieval

5. Education and Training
   - Use experience and eliminate recidivism (repeat offenses)
   - Present number of reported, verified, and eliminated incidents in the Annual Report.

Final
Monitoring Workplan for the Assessment of Trash in San Diego County Watersheds

Prepared For:

The County of San Diego

August 30, 2007

BROWN AND CALDWELL

Environmental Engineers & Consultants

WESTON SOLUTIONS

FINAL
Monitoring Workplan for the Assessment of Trash in San Diego County Watersheds

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August 30, 2007

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1.0 INTRODUCTION

In accordance with the Receiving Waters and Urban Runoff Monitoring and Reporting Program No. R9-2007-0001 permit requirements (Permit), the San Diego Municipal Copermittees (Copermittees) are required to assess the presence of trash in receiving waters and urban runoff at each dry weather field screening site, mass loading station (MLS), and temporary watershed assessment station (TWAS) in the San Diego Watersheds. This trash assessment program is designed to provide information on the spatial extent and relative amount of trash present, as well at the nature of the trash present. Permit Section II A. 1. k. (Receiving Waters Monitoring Program) states: *"The Copermittees shall collaborate to develop and implement a program to assess the presence of trash (anthropogenic litter) in receiving waters. The program shall collect and evaluate trash data in conjunction with collection and evaluation of analytical data."* Additionally, Section II. B.3.c. (7) (Dry Weather field Screening and Analytical) requires the Copermittees to: *"Assess the presence of trash in receiving waters and urban runoff at each dry weather field screening or analytical monitoring station."*

1.1 Background

Trash is not only an aesthetic concern, but one which can adversely affect water quality, fish and wildlife, and the beneficial uses of water bodies. It can affect beneficial uses such as recreation in water bodies (fishing and swimming) and degrade aquatic habitat. Trash may become marine debris and has the potential to harm fish and wildlife as it travels through streams and rivers and reaches the ocean. Most water quality concerns from trash are related to wildlife in the form of entanglement and ingestion. In addition to wildlife, the human health effects from poor water quality are sometimes a result of discarded medical waste, human or pet waste, and broken glass. Trash "hotspots" such as illegal dumping, littering, and/or accumulation of trash are also of concern from a management perspective. Trash in the form of leaf litter or other organic materials (such as from intentional dumping) can be of concern and cause nutrient and ecosystem imbalance in streams and rivers. During storms, trash may block drainage areas and result in flooding that erodes soils by undercutting stream banks. Excess suspended solids (including trash) are detrimental to aquatic organisms and may scour stream beds and damage habitats.

The San Francisco Bay Region implemented a rapid trash assessment from 2002 through 2005 in order to support Clean Water Act Section 303(d) listing decisions and, in conjunction with the SWAMP program, produced a document called "A Rapid Trash Assessment Method Applied to Waters of the San Francisco Bay Region: Trash Measurement in Streams." The Trash Assessment Program for San Diego Watersheds will parallel the approach outlined in this document. Other work in the San Diego area has been conducted by the City of San Diego Storm Water Division, which currently assesses trash at various locations in Chollas Creek. The monitoring is done once a year at dry weather sites and employs a simplified version of the ranking system developed by the San Francisco Bay Region. A similar assessment is being conducted in Forrester Creek by the City of El Cajon. In an attempt to expand upon these studies and accurately represent the range of conditions found in San Diego Watersheds, the Dry-Weather Monitoring Sub-Workgroup has developed a trash assessment form (Attachment 1) which provides five categories to describe the abundance of trash.

1.2 Monitoring Objectives and Assessment Questions

The overall monitoring objective is to assess the relative amounts of trash within the San Diego Watersheds. Until now, the nature of trash within most watersheds has been unknown and, although problem areas have been identified, it is unclear how much trash can be attributed to urban runoff. The primary objective of this program is to develop a qualitative assessment of trash in San Diego Watersheds by providing information on the spatial extent and relative amount of trash present, as well as the nature of the types of trash present. This program will also evaluate the spatial and temporal variability in trash distribution and assist the Copermittees in setting watershed priorities.

Section II.A.9 of the Permit Fact Sheet states that *"Since a monitoring program for trash is new, the Copermittees are provided significant leeway in the development and implementation of the program. The Copermittees can utilize the flexibility incorporated into the MRP (Monitoring and Reporting Program) to develop a program that is workable for them while providing the necessary information."*

In order to assess the presence of trash for use in this program, the following questions are asked:

Q1. Where is trash being detected in San Diego Watersheds?

By performing trash assessments at each of the MLS and TWAS during wet and dry weather events and at the dry weather monitoring locations during dry events using a standardized trash monitoring form (Attachment 1), the Copermittees will assess approximately 1,000 sites per year, which will determine where trash is being detected. This spatial information on trash will assist the Copermittees with identifying problem areas that will in turn be considered to develop regional and watershed priorities.

Q2. How many sites are identified as submarginal or poor?

At sites identified as submarginal or poor, the spatial extent, relative amounts, and nature of trash present will also be evaluated through the use of the standardized trash monitoring form mentioned in Q1 above (Attachment 1). These results will help the Copermittees identify the nature of problem areas and aid Copermittees in prioritizing sites. Sites can also be reviewed over time to evaluate any trends (positive or negative) on a jurisdictional, watershed and regional level. Sites will be assessed during the initial monitoring period (i.e. first reporting cycle). Recommendations for program refinements will be made based on the data gathered over the first year of program implementation. An overall evaluation of trash levels and potential sources within individual watersheds will be conducted as part of the Annual Regional Monitoring Report.

Q3. In locations identified as submarginal or poor, what is the nature of the types of trash present?

The nature of the types of trash identified at submarginal, and poor sites will help the Copermittees determine the potential sources and routes of trash which can then guide management actions. The potential implementation of management actions such as outreach

efforts to specific groups may be directed based on the information collected on the nature of trash.

2.0 MONITORING DESIGN

2.1 Trash Assessment

2.1.1 Locations

Trash assessments will be performed as part of the Regional Monitoring Program on a rotational basis during wet and dry weather monitoring at the locations discussed below.

Mass Loading Stations (MLS) and Temporary Watershed Assessment Locations (TWAS)
Trash assessment will be performed at MLS and TWAS monitoring sites during both dry ambient monitoring and storm event monitoring. These sites will provide information on the relative amounts of trash present in receiving waters. The minimum number of annual monitoring events required for each location is provided in Table 1. This schedule corresponds to that specifically outlined in the Permit.

Table 1. Trash Monitoring Locations and Number of Annual Monitoring Events.

Watershed	Permit Year 2007-2008		Permit Year 2008-2009*		Permit Year 2009-2010		Permit Year 2010-2011		Permit Year 2011-2012	
	MLS	TWAS	MLS	TWAS	MLS	TWAS	MLS	TWAS**	MLS	TWAS**
Santa Margarita River	4		1				4			
San Luis Rey River	4	4	1				4	4		
Loma Alta Creek		4						4		
Buena Vista Creek		4						4		
Agua Hedionda Creek	4	4	1				4	4		
Escondido Creek	4	4	1				4	4		
San Dieguito River	4	8	1				4	8		
Los Peñasquitos Creek	4	8	1				4	8		
Rose Creek						4				4
Tecolote Creek			1		4	4			4	4
San Diego River			1		4	12			4	12
Chollas Creek	4		1		4		4		4	
Sweetwater River			1		4	4			4	4
Otay River						4				4
Tijuana River			1		4	8			4	8

*Bight '08 Monitoring Year
** TWAS Locations may change based on information gathered during the first rotation

Dry Weather Monitoring Stations

Trash assessment will be conducted at established dry weather field screening locations. Stations within each Copermittee's jurisdiction will be identified in the Jurisdictional Urban Runoff Management Plans to be submitted in January 2008.

2.1.2 Frequency

The Trash Assessment Form will be completed at each location during each monitoring event. MLS and TWAS locations will be monitored on a rotational basis between the northern and southern watersheds during two wet weather and two dry weather (ambient) monitoring events per year. Each of the selected dry weather monitoring locations will be assessed for trash at least once between May 1st and September 30th of each year (or as often as the Copermittees determine is necessary to comply with permit requirements).

2.1.3 Trash Assessment Procedures

Prior to a site visit, it is important to identify personnel who are familiar with the site and have some local knowledge of the general area. There should also be a general consensus among the monitoring team as to the extent of the area to be assessed. When a site is first established, the length of the site being assessed should be determined as a channel or shore length. When possible, distinctive site characteristics, such as a large boulder or tree, should be used as starting/finishing length landmarks. The upper boundary of each bank should be used for the width of the monitoring site. This can be determined visibly by either a debris or water line. When determining site boundaries, it is important to remember that the intent of the trash assessment is to determine the trash which has been mobilized or has the potential to be mobilized by water at the defined locations.

Upon arrival at a designated site, a qualitative estimate of the presence of trash should be determined and documented in the top portion of the Trash Assessment Form (Attachment 1). This is a qualitative assessment which should reflect a first impression of the site. There are five categories to describe the amount and extent of trash at each site:

- *Optimal:* On first glance, no trash is visible. Little or no trash (<10 pieces) is evident when the evaluated area is closely examined for litter and debris.
- *Suboptimal:* On first glance, little or no trash is visible. After close inspection, small levels of trash (~10-50 pieces) are evident in the evaluated area.
- *Marginal:* Trash is evident in low to medium levels (~51-100 pieces) on first glance. Evaluated area contains litter and debris. Evidence of site being used by people: scattered cans, bottles, food wrappers, blankets, or clothing are present.
- *Submarginal:* Trash distracts the eye on first glance. Evaluated area contains substantial levels of litter and debris (>100-400 pieces). Evidence of site being used frequently by people: many cans, bottles, food wrappers, blankets, or clothing are present.
- *Poor:* Site is significantly impacted by trash. Evidence of trash accumulation behind a constriction point or evidence of excessive dumping. Evaluated area contains substantial levels of litter and debris (>400 pieces).

Sites will also be evaluated to determine the threat to human health and/or threat to aquatic health. In some cases, sites may pose a threat to both categories. The evaluation of each category is presented as follows:

- Threat to Human Health - Site poses a threat to human health via swimming, wading, or walking through the area. Trash and debris has the potential to contain chemicals that may bioaccumulate, transmit dangerous bacteria (e.g. medical waste, diapers, human waste), or has the potential for physical harm (sharps, entanglement, nails, etc…). Comments should be added at the bottom of the field sheet for clarification.

- Threat to Aquatic Health – Site poses a threat to aquatic health or other wildlife (via contact, ingestion, entanglement, etc...) from the trash and debris present. Trash and debris such as small floatable material that is persistent and can be transported long distances may resemble food and may be ingested. Wire, plastic, fishing line, and other material that has the potential for entanglement. Oil and other visible chemicals or chemical containers falls in this category. Comments should be added at the bottom of the field sheet for clarification.

If the quantity of trash falls into the submarginal, or poor category, assessments of the type(s) of trash present, the potential trash mobilization route, and the potential source will occur. Categories of trash types listed on the form include:

- Automotive
- Biohazard waste
- Business Related
- Cigarette Butts
- Construction
- Fabric/Clothing
- Food Packaging
- Food Waste
- Household
- Shopping Carts
- Toxic
- Yard Waste

The types of trash present should be ranked in order of their prevalence (from 1 to 12, where 1 is the most prevalent and 12 is the least prevalent). Next, the user should try to determine the potential mobilization route for the trash (e.g., dumping, littering, or upstream sources). If the route is unknown, then it may be described as "unable to determine." Finally, the user should check the potential sources of the trash. The form includes the following source categories:

- Household
- Construction
- Commercial
- Industrial
- School
- Transient

Again, if the source is unknown, the form includes the category "unable to determine." Prior knowledge of the surrounding area will help when making assumptions about the potential route and sources of trash present.

3.0 ASSESSMENT AND REPORTING

3.1 Trash Assessment

The regional and jurisdictional trash assessments provide Copermittees with valuable information they can use to make informed decisions on how to address problem areas. Information such as potential sources and/or types of trash may guide the Copermittees efforts on outreach to the appropriate target groups. This information may also be used to guide the selection of management actions where appropriate. In order to evaluate the nature and extent of trash accumulation, the following questions are asked as the basis for the monitoring design:

Q1. Where is trash being detected in San Diego Watersheds?

The presence of trash in receiving waters and MS4 locations will be differentiated and illustrated in tabular and graphical formats. GIS maps may also be used, when applicable, to depict the relative amounts of trash at the MLS, TWAS and dry weather monitoring locations across San Diego County.

Q2. How many sites are identified as submarginal or poor?

Summarizing information on how many sites with submarginal, or poor trash levels can provide a general overview of where problem areas occur throughout the region. The number of problem sites can be tracked annually and evaluated over time. This type of assessment can be conducted on both a regional and watershed scale, as well as jurisdictionally in the Dry Weather Monitoring reports. General information on the number of submarginal, or poor sites per watershed will be presented in tabular and graphical formats in regional and watershed assessments. Jurisdictional assessments could also track problem sites over time to determine if management efforts are working. Evaluating the effectiveness of outcomes such as behavior changes and load reductions, where applicable, may be appropriate after evaluating multiple years of data and observing improvements or declines in site conditions.

Q3. In locations identified as submarginal, or poor, what is the nature of the types of trash present?

In locations where submarginal, or poor trash levels are present, additional analysis of the nature of trash present will be performed. These analyses may differentiate between dry and wet weather monitoring events, as well as between receiving waters and MS4 monitoring locations. During the first year assessment period, general information on the number of submarginal, or poor sites per watershed along with the predominant trash types and potential sources will be presented in tabular and graphical formats in regional and watershed assessments. Additionally, the number of sites determined to be threats to human and/or aquatic health will be presented in tabular format. The information assessed may then be used to identify regional strategies to develop targeted outreach strategies, where applicable. When appropriate, these data could be

used by watershed groups and/or jurisdictions to single out a predominant source and/or type of trash that commonly occurs. The data may also help guide the selection of management actions where appropriate.

3.2 Reporting

Trash assessment reporting will be presented on a jurisdictional basis in the Jurisdictional Urban Runoff Monitoring Program (JURMP) Reports and on a watershed basis in the Annual Regional Monitoring Report. The Annual Regional Monitoring Report will include summary statistics of trash assessment data within each watershed management area assessment section. Copermittees will also provide jurisdictional trash assessments in their individual dry weather reports contained in their JURMPs. These assessments will follow the Permit requirements for reporting the dry weather monitoring program. Trash monitoring data from jurisdictional dry weather monitoring and MLS/TWAS monitoring will be assessed by modifying the current Watershed Data Assessment Framework used for establishing frequency of occurrence for water quality parameters. This assessment will provide the Copermittees with information needed to make informed decisions on where to address problem areas related to trash. The diamond ranking system for determining constituent of concern (COC) frequency of occurrence rankings of "high", "medium", or "low" will be used to assess the watersheds trash data. These criteria will take into account the dry weather monitoring and MLS/TWAS sites with submarginal, or poor assessments only; and classify each COC as high, medium or low frequency of occurrence in the watershed. The classification of COC can change from year to year in response to the changes in the levels of trash being identified within the watershed.

4.0 Program Review and Modification

As stated previously in this document, Order 2007-0001 provides the Copermittees flexibility to develop a workable trash assessment program. Specifically, section II.A.9 of the Permit Fact Sheet states:

"Since a monitoring program for trash is new, the Copermittees are provided significant leeway in the development and implementation of the program. The Copermittees can utilize the flexibility incorporated into the MRP (Monitoring and Reporting Program) to develop a program that is workable for them while providing the necessary information."

The program described in this document meets the Permit criteria for a trash monitoring program. As stated previously in this program, the initial year of trash monitoring focuses on qualitative assessments of trash at sites within the region. This was determined to be the most acceptable approach because it enables Copermittees to collect a relatively consistent set of data, while making initial assessments of the overall impacts of trash within the region. To date, Copermittees cannot be certain that a high number of sites are impacted with trash. More importantly, Copermittees need to ensure that the data they collect can be directly related to making management decisions (ie site cleanups, increased BMPs, etc) and to water quality improvements.

Because the program is newly developed and has not yet been field tested, it is appropriate to assume that modifications may need to be made after an initial assessment of the data collected.

Copermittees intend to evaluate the data and determine where and how program modification will be made. Particularly important will be data collected from sub-marginal and poor sites. Where initial data suggests that the incorporation of quantitative assessments will lead to improvements in water quality, then Copermittees will modify the program to include quantitative measures.

5.0 REFERENCES

California Regional Water Quality Control Board, San Diego Region. 1994. *Water Quality Control Plan for the San Diego Basin (9).*

California Regional Water Quality Control Board, San Francisco Region. 2007. *A Rapid Trash Assessment Method Applied to Waters of the San Francisco Bay Region: Trash Measurement in Streams.*

ATTACHMENT 1: TRASH ASSESSMENT FORM

Draft Trash Assessment Form

SITE ID: _____ **DATE:** _____

LOCATION: _____ **TIME:** _____

OBSERVER: _____

PREVIOUS TRASH ASSESSMENT RATING (IF APPLICABLE):

ESTIMATED AREA OF ASSESSMENT L X W (FT):

Amount and Extent of Trash	
EVALUATION OF TRASH INCLUDES*: ☐ **MS4** ☐ **RECEIVING WATER** ☐ **BOTH**	
☐ **Optimal**	On first glance, no trash visible. Little or no trash (<10 pieces) evident when evaluated area is closely examined for litter and debris.
☐ **Suboptimal**	On first glance, little or no trash visible. After close inspection small levels of trash (~10-50 pieces) evident in evaluated area.
☐ **Marginal**	Trash is evident in low to medium levels (~51-100 pieces) on first glance. Evaluated area contains litter and debris. Evidence of site being used by people: scattered cans, bottles, food wrappers, blankets, or clothing present.
☐ **Submarginal**	Trash distracts the eye on first glance. Evaluated area contains substantial levels of litter and debris (>100- 400) . Evidence of site being used frequently by people: many cans, bottles, food wrappers, blankets, or clothing present.
☐ **Poor**	Site is significantly impacted by trash. Evidence of trash accumulation behind a constriction point or evidence of excessive dumping. Evaluated area contains substantial levels of litter and debris (>400 pieces).

* In areas where receiving water is accessible and adjacent to dry weather site, trash evaluation must include receiving water.

Site Evaluation for Threat to Human Health and/or Aquatic Health	
☐ **Threat Human Health**	Site poses a threat to human health via swimming, wading, or walking through the area. Trash and debris has the potential to contain chemicals that may bioaccumulate, transmit dangerous bacteria (e.g. medical waste, diapers, human waste), or has the potential for physical harm (sharps, entanglement, nails, etc…). Comments should be added for clarification .
☐ **Threat to Aquatic Health**	Site poses a threat to aquatic health or other wildlife (via contact, ingestion, entanglement, etc...) from the trash and debris present. Trash and debris such as small floatable material that is persistent and can be transported long distances may resemble food and may be ingested. Wire, plastic, fishing line, and other material that has the potential for entanglement. Oil and other visible chemicals or chemical containers falls in this category. Comments should be added for clarification.

- **Complete the following section for Marginal, Submarginal, and Poor Evaluations ONLY**

TYPE	Ranking or Count by Type *	POTENTIAL ROUTE (CHECK UP TO 2)				POTENTIAL SOURCE (CHECK UP TO 2)						
		Dumping	Littering	Upstream	Unable to determine	Household	Construction	Commercial	Industrial	School	Transient	Unable to determine
Automotive												
Biohazard Waste												
Business Related												
Cigarette Butts												
Construction												
Fabric/Clothing												
Food Packaging												
Food Waste												
Household												
Shopping Carts												
Toxic												
Yard Waste												

* Only rank the types of trash PRESENT in evaluated area from 1 through 12 (1 is most prevalent – 12 is least prevalent). DO NOT rank types of trash that are not present in evaluated area.

Comments:_____

_____

_____

_____

_____

_____

_____

_____

Note: This draft form may be updated by the Dry Weather Monitoring Workgroup